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10/628,403	07/29/2003	Alain Vallee	040699-0156	3986

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FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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**Office Action Summary**

Application No.

10/628,403

Applicant(s)

VALLEE ET AL.

Examiner

Raymond Alejandro

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 April 2005.  
 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
 4a) Of the above claim(s) 16 and 17 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-15 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 29 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date 01/21/05, 12/01/03.  
 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) ☐ Notice of Informal Patent Application (PTO-152)  
 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION*****Election/Restrictions***

1. Applicant's election with traverse of Group I and Species (claims 1-15) in the reply filed on 04/04/06 is acknowledged. The traversal is on the ground(s) that "*the subject matter of all of claims 1-17 and species 1 and 2 are sufficiently related that a thorough and complete search for the subject matter of elected claims and species would necessarily encompass a thorough and complete search for the subject matter of the non-elected claims and species*". This is not found persuasive because the particular search for the elected claims is not required for non-elected claims, that is, the search required for the battery per se, classified in class 429/306, is not particularly required for the method for manufacturing the battery, classified in class 29/623.1. As admitted by the applicants, the inventive concepts involve both the battery per se and the method for manufacturing the battery. Moreover, since the restriction requirement has been treated as a process of making and product made, it is further noted that the inventions are distinct because the product as claimed can be made by another and materially different process, for instance, a product made by a process where all the solvent used during the manufacturing process is dried such that the final product contains virtually non solvent; and/or a battery construction that also uses polyimide but instead of relying on a dry electrolyte, it employs a liquid electrolyte. In addition, the two groups have separate classification, a different field of search and a separate status in the art. Accordingly, serious burden would be raised if the search of both groups was made as required for the separate and distinct inventions.

The requirement is still deemed proper and is therefore made **FINAL**.

***Information Disclosure Statement***

2. The information disclosure statements (IDS) submitted on 01/21/05 and 12/04/03 were considered by the examiner.

***Drawings***

3. The drawings were received on 07/29/03. These drawings are acceptable.

***Specification***

4. The preliminary amendment filed 10/17/03 does not introduce new matter into the disclosure. Such an amendment corrected typographical errors detected by the applicant. The specification as filed does support with specific examples the use of polyimide.

5. The use of the trademarks "MATRIMID XU5218", "ULTEM 1000O"; "LaRC-CP1"; "LaRC-CP2"; "LaRC-Si"; "Kynar Flex"; and "Celgard 3401" have been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

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### ***Claim Objections***

6. Claim 1 is objected to because of the following informalities: the abbreviation "PEA" should be changed to its standard or general nomenclature or terminology. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 2 recites the limitation "the portable electronic appliance" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting

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ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-4 and 7-15 are provisionally rejected on the ground of nonstatutory

obviousness-type double patenting as being unpatentable over claims 1, 3-9, 21 and 23-24 of copending Application No. 10/628290 (US Patent Application Publication 2005/0153209).

Although the conflicting claims are not identical, they are not patentably distinct from each other because:

The copending application '290 claims the following (CLAIMS 1, 3-9, 21 and 23-24):

1. A battery comprising:

at least one metallic lithium or lithium alloy anode;

at least one cathode,

and a polyimide-based electrolyte separator disposed between said at least one metallic lithium or lithium alloy anode and said at least one cathode; said polyimide-based electrolyte separator comprising a soluble polyimide, a lithium salt, and from about 10% by weight to about 60% by weight of solvent.

3. A battery as defined in claim 1 wherein said polyimide-based electrolyte separator comprises from about 20% by weight to about 40% by weight of solvent.

4. A battery as defined in claim 1 wherein said solvent is selected from the group consisting of N,N-methylpyrrolidone (NMP), gamma-butyrolactone, and sulfamides of formula:  $R_1R_2N-SO_2-NR_3R_4$ , in which  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are alkyls having between 1 and 6 carbon atoms and/or oxyalkyls having between 1 and 6 carbon atoms or combinations thereof.

5. A battery as defined in claim 1 wherein said at least one cathode comprises a current collector, an active material; an electronic conductive filler; and an ionically conductive electrolyte polyimide binder; wherein said electrolyte polyimide binder comprises a lithium salt and a pre-imidized soluble polyimide, and wherein the lithium salt and the pre-imidized soluble, polyimide are soluble in a polar solvent.

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6. A battery as defined in claim 1 wherein said at least one cathode comprises a current collector, an active material; an electronic conductive filler; an ionically conductive electrolyte polyether and a lithium salt.

7. A battery as defined in claim 6 wherein said active material is selected from the group consisting of:  $\text{LiCoO}_2$ ;  $\text{LiMnO}_2$ ;  $\text{LiMn}_2\text{O}_4$ ;  $\text{LiNiO}_2$ ;  $\text{LiV}_3\text{O}_8$ ;  $\text{V}_2\text{O}_5$ ;  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  and  $\text{LiFePO}_4$ .

8. A battery as defined in claim 5 wherein said active material is selected from the group consisting of:  $\text{LiCoO}_2$ ;  $\text{LiMnO}_2$ ;  $\text{LiMn}_2\text{O}_4$ ;  $\text{LiNiO}_2$ ;  $\text{LiV}_3\text{O}_8$ ;  $\text{V}_2\text{O}_5$ ;  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  and  $\text{LiFePO}_4$ .

9. A battery as defined in claim 1 wherein said lithium salt is selected from the group consisting of lithium tetrafluoro-sulfonimide, lithium salts derived from bis perhalogenoacyl and bis sulfonylimide,  $\text{LiCl}$ ,  $\text{LiBr}$ ,  $\text{LiI}$ ,  $\text{Li}(\text{ClO}_4)$ ,  $\text{Li}(\text{BF}_4)$ ,  $\text{Li}(\text{PF}_6)$ ,  $\text{Li}(\text{AsF}_6)$ ,  $\text{Li}(\text{CH}_3\text{CO}_2)$ ,  $\text{Li}(\text{CF}_3\text{SO}_3)$ ,  $\text{Li}(\text{CF}_3\text{SO}_2)_2\text{N}$ ,  $\text{Li}(\text{CF}_3\text{SO}_2)_3$ ,  $\text{Li}(\text{CF}_3\text{CO}_2)$ ,  $\text{Li}(\text{B}(\text{C}_6\text{H}_5)_4)$ ,  $\text{Li}(\text{SCN})$ , and  $\text{Li}(\text{NO}_3)$ .

21. A battery comprising:

at least one anode;

at least one cathode,

and a polyimide-based electrolyte separator disposed between said at least one anode and said at least one cathode; the polyimide-based electrolyte separator comprising a cross linked polyimide matrix, a lithium salt, and from about 10% by weight to about 60% by weight of solvent.

22. A battery as defined in claim 21 wherein said polyimide-based electrolyte separator comprises from about 15% by weight to about 50% by weight of solvent.

23. A battery as defined in claim 21 wherein said polyimide-based electrolyte separator comprises from about 20% by weight to about 40% by weight of solvent.

24. A battery as defined in claim 21 wherein said solvent is selected from the group consisting of N,N-methylpyrrolidinone (NMP), gamma-butyrolactone, and sulfamides of formula:  $\text{R}_1\text{R}_2\text{N}-\text{SO}_2-\text{NR}_3\text{R}_4$ , in which  $\text{R}_1$ ,  $\text{R}_2$ ,  $\text{R}_3$  and  $\text{R}_4$  are alkyls having between 1 and 6 carbon atoms and/or oxyalkyls having between 1 and 6 carbon atoms or combinations thereof.

*In the instant case, combinations of claims 1, 3-9, 21 and 23-24 of copending*

*Application '290 render obvious the present claims. That is to say, the combinations of the*

*subject matter of claims 1, 3-9, 21 and 23-24 of copending Application '290 represent obvious*

*variations the claimed subject matter.*

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-2, 5-6 and 9 (*at least*) are rejected under 35 U.S.C. 102(b) as being anticipated by Clingempeel 5895731.

The present claims are directed to a battery wherein the disclosed inventive concept comprises the specific electrolyte separator including polyimide.

As to claim 1:

Clingempeel discloses a thin-film lithium battery including a lithium anode; a cathode (ABSTRACT) and a gel electrolyte including a quantity of N-methylpyrrolidone and lithium contained within a polyimide matrix (ABSTRACT). Specifically, a polyimide cell-separator sheet is constructed by mixing polyimide with NMP in a 9:1 ratio (COL 5, lines 58-62).

***Examiner's note:*** *as to the specific preamble reciting "for a PEA", it is pointed out that the preamble refers to intended use. That is, the claim is directed to a battery per se and the preamble phrase "for a PEA" is only a statement of ultimate intended utility.*

As to claim 2:

Clingempeel discloses lithium batteries (TITLE/COL 1, lines 5-8) for computer applications (COL 1, lines 10-15).



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**Examiner's note:** *as to the specific preamble reciting "for a PEA", it is pointed out that the preamble refers to intended use. That is, the claim is directed to a battery per se and the preamble phrase "for a PEA" is only a statement of ultimate intended utility.*

**As to claims 5-6:**

Clingempeel teaches thin-film lithium batteries (TITLE). *Thus, the specific battery weight is an inherent characteristic of the exemplified battery.*

**As to claim 9:**

N-methylpyrrolidone is used as a solvent (ABSTRACT/ COL 5, lines 58-62).

Thus, the present claims are anticipated.

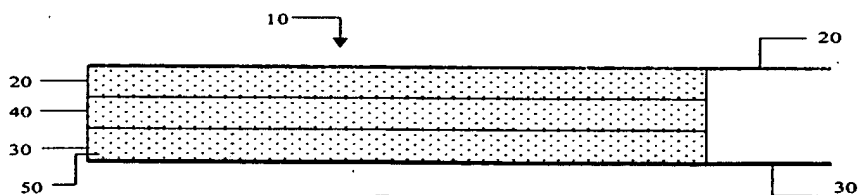
14. Claims 1-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Gustafson et al 6451480.

The present claims are directed to a battery wherein the disclosed inventive concept comprises the specific electrolyte separator including polyimide.

**Concerning claim 1:**

Gustafson et al disclose a battery comprising an anode, a cathode and a separator film disposed between each anode and each cathode (ABSTRACT/CLAIM 1/FIGURE 1).

**Figure 1** below illustrates the anode 20, the separator 40, the cathode 30 and the liquid electrolyte 50.



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In particular, Gustafson et al disclose that the cathode comprises a metal oxide, an electronic conductive filler and an ionically conductive and electrochemically active cathode solid electrolyte polyimide binder (COL 3, lines 48-61). In another embodiment, the anode is ionically conductive and electrochemically active including solid electrolyte polyimide binder (COL 4, lines 6-20). It is disclosed that the ionically conductive and electrochemically active anode may be combined with any cathode, separator film and liquid electrolyte known to those skilled in the art or it may be used with the ionically conductive and electrochemically active cathode to form a liquid electrolyte lithium-ions battery (COL 4, lines 25-31). Disclosed is that the solid electrolyte polyimide binder is soluble in any polar solvent including NMP and gamma-butyrolactone (COL 3, lines 60-67/ COL 4, lines 15-25).

Disclosed is that the cathode contains from about 27 % by weight to about 35 % by weight of a polar solvent such as NMP or gamma-butyrolactone (COL 5, lines 35-45).

**EXAMPLE 1** shows the use of NMP solvent in an amount of 27-35 % by weight (Example 1; COL 9, lines 58-65). *Thus, Gustafson et al show with sufficient specificity the use of a solvent within the claimed weight percent range. It is further noted that since both the anode and the cathode contains the solid electrolyte polyimide binder, the interfaces of the anode-separator and the cathode-separator satisfy the claimed requirement of furnishing the electrolyte separator comprising the polyimide and the specific amount of solvent.*

**Examiner's note:** *as to the specific preamble reciting "for a PEA", it is pointed out that the preamble refers to intended use. That is, the claim is directed to a battery per se and the preamble phrase "for a PEA" is only a statement of ultimate intended utility.*

**As to claim 2:**

**Examiner's note:** *as to the specific preamble reciting "for a PEA" or "the specific portable electronic appliance", it is pointed out that they refers to intended use. That is, the claim is directed to a battery per se and the preamble phrase "for a PEA" and/or "the specific portable electronic appliance" is only a statement of ultimate intended utility.*

**Concerning claims 3-4 and 9:**

Disclosed is that the cathode contains from about 27 % by weight to about 35 % by weight of a polar solvent such as NMP or gamma-butyrolactone (COL 5, lines 35-45).

**EXAMPLE 1** shows the use of NMP solvent in an amount of 27-35 % by weight (Example 1; COL 9, lines 58-65).

**As for claims 5-6:**

**EXAMPLE 2** shows a battery prepared using the specific electrodes and electrolyte solutions and battery components of Example 1 (See EXAMPLE 2). *Thus, the specific battery weight is an inherent characteristic of the exemplified battery.*

**Concerning claims 7-8:**

Gustafson et al disclose an anode comprising intercalation material and a current collector (COL 4, lines 7-11).

**Concerning claims 10-13:**

Gustafson et al disclose a cathode comprising a metal oxide, an electronic conductive filler; and the ionically conductive solid electrolyte polyimide binder (COL 5, lines 19-25). The metal oxides include  $\text{LiCoO}_2$ ,  $\text{LiMnO}_2$ ,  $\text{LiNiO}_2$ ,  $\text{V}_6\text{O}_3$ ,  $\text{V}_2\text{P}_5$  and  $\text{LiMn}_2\text{O}_4$  (COL 6, lines 22-25).

**Concerning claims 14-15:**

The following Li-salts are disclosed (COL 5, lines 62-65/ COL 8, lines 1-5):

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weight of a lithium salt. Preferably, the lithium salt is selected from the group consisting of: LiCl, LiBr, LiI, Li(ClO<sub>4</sub>), Li(BF<sub>4</sub>), Li(PF<sub>6</sub>), Li(AsF<sub>6</sub>), Li(CH<sub>3</sub>CO<sub>2</sub>), Li(CF<sub>3</sub>SO<sub>3</sub>), Li(CF<sub>3</sub>SO<sub>2</sub>)<sub>2</sub>N, Li(CF<sub>3</sub>SO<sub>2</sub>)<sub>3</sub>, Li(CF<sub>3</sub>CO<sub>2</sub>), Li(B(C<sub>6</sub>H<sub>5</sub>Li)(NO<sub>3</sub>)). Most preferably, the lithium salt is 65 Li(PF<sub>6</sub>). The lithium salt provides ionic conductivity to the cathode.

Thus, the present claims are anticipated.

### ***Conclusion***

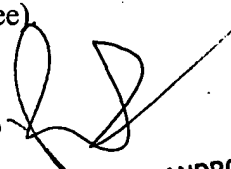
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282.

The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro  
Primary Examiner  
Art Unit 1745

  
**RAYMOND ALEJANDRO  
PRIMARY EXAMINER**